

PRIMERGY RX100 S4 Server

Options Guide

Edition April 2007

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Certified documentation according to DIN EN ISO 9001:2000

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2000.

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1 Introduction

The PRIMERGY RX100 S4 server is an Intel-based server for small and medium-sized networks. The compact server casing (only one height unit) as well as its scalability and security features make the PRIMERGY RX100 S4 the perfect choice for operational areas data centers, Internet- and application-hosting.

1.1 Overview of the documentation



PRIMERGY manuals are available in PDF format on the *ServerBooks* CD which is supplied in the ServerView Suite package for every server system.

These PDF files can also be downloaded free of charge from the Internet: at <http://manuals.fujitsu-siemens.com> you will find an overview page with the online documentation available on the Internet. You can go to the PRIMERGY Server documentation by clicking on “industry standard servers”.

Concept and target groups

This Options Guide shows you how you can expand and upgrade the server.



The Operating Manual for the server describes how you install/remove the hot-plug components.

The activities described in this manual may only be performed by technical specialists.

Additional documentation about the server

The PRIMERGY RX100 S4 documentation comprises the following additional manuals:

- “Safety notes and other important information” (print version delivered together with the system, PDF file available on the *ServerBooks* CD)
- “Warranty” (print version delivered together with the system, PDF file available on the *ServerBooks* CD)
- “Ergonomics” (PDF file available on the *ServerBooks* CD)
- “Returning used devices” (PDF file available on the *ServerBooks* CD)

- “RX100 S4 Server Operating Manual” (PDF file available on the *ServerBooks* CD)
- Technical Manual for the system board D2532 (PDF file available on the *ServerBooks* CD)
- “BIOS Setup” manual (PDF file available on the *ServerBooks* CD)
- “ServerView Suite” includes the *ServerStart* CD, the *ServerBooks* CD and the print version of the manual “PRIMERGY ServerView Suite - ServerStart”. The PDF file of the manual is also available on the *ServerBooks* CD.



If you need a backup of the *ServerBooks* CD, send the details of your server via email address: Reklamat-PC-LOG@fujitsu-siemens.com.

- “Global Array Manager Client Software User’s Guide” (PDF file available on the *ServerBooks* CD)
- “Global Array Manager Server Software User’s Guide” (PDF file available on the *ServerBooks* CD)
- “LSI SATA Software RAID User’s Guide” (PDF file available on the *ServerBooks* CD)

Further sources of information:

- Technical Manual on the relevant rack
- Manual on the monitor
- Manual on *ServerView* Server Management
- Manual on *RemoteView* Remote Server Maintenance
- Documentation on your operating system
- Information files on your operating system

(see also [“Related publications” on page 47](#))

1.2 Extensions and conversions

The PRIMERGY RX100 S4 server is offered in a SATA and a SAS version. The versions differ in the chipset assembling of the system board and in the configuration of the hard disks.

Extension of the main memory

The four slots for the main memory are suitable for unbuffered DDR II 533 (PC2-4200) SDRAM memory modules. The organization in two memory banks, 1 and 2, permits rapid memory access with two-way interleaving.

If the memory modules are populated in pairs, each pair must consist of identical memory modules (2-way interleaved mode).

Additional accessible drive

One 5.25-inch slimline bay is available for accessible drives.

Additional non-hot-plug SATA hard disk drive (only SATA version)

A second bay is available for non-hot-plug SATA hard disk drives.

Additional controllers in the PCI slots

The system board offers 2 x PCI-X (64 Bit / 133 MHz) or 1x PCI-Express x8 and 2 x PCI-X (64 Bit / 133 MHz) slots by a riser card.

Upgrading non-hot-plug variant to hot-plug variant (only SATA version)

The non-hot-plug variant can be upgraded to a hot-plug variant by installing a SAS/SATA backplane and inserting hot-plug SATA hard disks.

1.3 Notational conventions

The following notational conventions are used in this manual:



<i>Text in italics</i>	indicates commands, menu items or software programs.
„Quotation marks“	indicate names of chapters and terms that are being emphasized.
►	describes activities that must be performed in the order shown.
 CAUTION!	pay particular attention to texts marked with this symbol. Failure to observe this warning may endanger your life, destroy the system or lead to the loss of data.
	indicates additional information, notes and tips.

Table 1: Notational conventions

2 Procedure



CAUTION!

The actions described in these instructions should only be performed by technical specialists. Equipment repairs should only be performed by service personnel. Any unauthorized opening and improper repairs could expose the user to risks (electric shock, energy hazards, fire hazards) and could also damage the equipment. Please note that any unauthorized opening of the device will result in the invalidation of the warranty and exclusion from all liability.

- ▶ First of all please familiarize yourself with the safety instructions in the section [chapter “Safety notes” on page 11](#) et seq. .
- ▶ Ensure that all required manuals (see [“Additional documentation about the server” on page 5](#)) are available, printing out the PDF files if necessary. You will definitely need the Operating Manual for the server and the Technical Manual for the system board.
- ▶ Shut down the server correctly, switch it off, pull out the power plug(s), and open the server as described in the [chapter “Preparation” on page 17](#) et seq. .
- ▶ Extend or upgrade your server as described in the relevant chapter.



The Operating Manual for the server describes how you install/remove the hot-plug components.

- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter “Completion” on page 37](#) et seq. .
- ▶ Start the operating system and, if necessary, configure it as required (see the Operating Manual).

3 Safety notes



The following safety notes are also provided in the “Safety notes and other important information” manual.

This device complies with the relevant safety regulations for data processing equipment.

If you have any questions about where you can set up the device, contact your sales outlet or our customer service team.



CAUTION!

The actions described in these instructions should only be performed by technical specialists. Equipment repairs should only be performed by service personnel. Any unauthorized openings and improper repairs could expose the user to risks (electric shock, energy hazards, fire hazards) and could also damage the equipment. Please note that any unauthorized openings of the device will result in the invalidation of the warranty and exclusion from all liability.

Before operating the device



CAUTION!

- During installation and before operating the device, observe the instructions on environmental conditions for your device.
- If the device is brought in from a cold environment, condensation may form both inside and on the outside of the machine.

Wait until the device has acclimatized to room temperature and is absolutely dry before starting it up. Material damage may be caused to the device if this requirement is not observed.

- Transport the device only in the original packaging or in packaging that protects it from knocks and jolts.

Installation and operation



CAUTION!

- If the server is integrated in an installation that receives power from an industrial (public) power supply network with the IEC309 connector, the (public) power supply protection must comply with the requirements for the non-industrial (public) power supply networks for the type A connector.
- The server automatically sets itself to a voltage in the range of 100 V to 127 V or 200 V to 240 V. Make sure that your local voltage is within this range.
- This device has a specially approved power cable and must only be connected to a grounded insulated socket.
- The ON/OFF button does not disconnect the device from the mains voltage. To completely disconnect it from the mains voltage, remove the power plug from the insulated socket.
- Always connect the device and the attached peripherals to the same power circuit. Otherwise you run the risk of losing data if, for example, the central processing unit is still running but the peripheral device (e.g. storage subsystem) has failed during a power outage.
- Data cables to peripheral devices must be adequately shielded.
- To the LAN wiring the requirements apply in accordance with the standards EN 50173 and EN 50174-1/2. As minimum requirement the use of a protected LAN line of category 5 for 10/100 MBps Ethernet, and/or of category 5e for Gigabit Ethernet is considered. The requirements of the specification ISO/IEC 11801 are to be considered.
- Route the cables in such a way that they do not form a potential hazard and that they cannot be damaged. When connecting up a device, refer to the relevant notes in this manual.
- Never connect or disconnect data transmission lines during a storm (lightning hazard).



CAUTION!

- Make sure that no objects (such as bracelets or paper clips) fall into or liquids spill into the device (risk of electric shock or short circuit).
- In emergencies (e.g. damaged casing, controls or cables, penetration of liquids or foreign matter), switch off the device immediately, remove the power plug and contact your sales outlet or customer service team.
- Proper operation of the device (in accordance with IEC 60950/EN 60950) is only ensured if the casing is completely assembled and the rear covers for the installation openings have been put in place (electric shock, cooling, fire protection, interference suppression).
- Only install system expansions that satisfy the requirements and rules governing safety and electromagnetic compatibility and relating to telecommunications terminal equipment. If you install other expansions, you may damage the system or violate the safety regulations and regulations governing RFI suppression. Information on which system expansions are suitable can be obtained from the customer service centre or your sales outlet.
- The components or parts marked with a warning label (e.g. lightning symbol) may only be opened, removed or exchanged by authorized, qualified personnel.
- The warranty expires if the device is damaged during the installation or replacement of system expansions.
- You may only set those resolutions and refresh rates specified in the „Technical data“ section of the monitor description. Otherwise, you may damage your monitor. If you are in any doubt, contact your sales outlet or customer service centre.

Batteries



CAUTION!

- Incorrect replacement of batteries may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer (see the technical manual for the system board under [“Related publications” on page 47](#)).
- Replace the lithium battery on the system board in accordance with the instructions in the technical manual for the system board (see [“Related publications” on page 47](#)).

Notes on handling CDs and CD-/DVD-ROM drives



CAUTION!

- Use only CDs in proper condition in the CD-/DVD-ROM drive of your server to prevent data loss, damage to the device and injuries.
- Therefore, check each CD for damage, cracks, breakage etc. before inserting it in the drive.

Please note that any additional labels applied may change the mechanical properties of a CD and cause imbalance.

Damaged and imbalanced CDs can break at high drive speeds (data loss).

Under certain conditions sharp-edged pieces of broken CDs can penetrate the cover of the drive (damage to the device) and be thrown out of the device (danger of injury, particularly on uncovered body parts such as the face or neck).



You protect the CD-/DVD-ROM drive and prevent mechanical damage, as well as premature wearing of the CDs, by observing the following suggestions:

- Only insert the CDs in the drive when needed and remove them after use.
- Store the CDs in suitable sleeves.
- Protect the CDs from exposure to heat and direct sunlight.

Note about the laser

The CD-/DVD-ROM drive is classified for laser class 1 according to IEC 60825-1.



CAUTION!

The CD-/DVD-ROM drive contains a laser diode (LED). Sometimes the LED produces a stronger laser beam than laser class 1. Direct view into this laser beam is dangerous.

Never remove parts of the CD-/DVD-ROM drive assembly!

Modules with electrostatic-sensitive components:

Systems and components that might be damaged by electrostatic discharge (ESD) are marked with the following label:

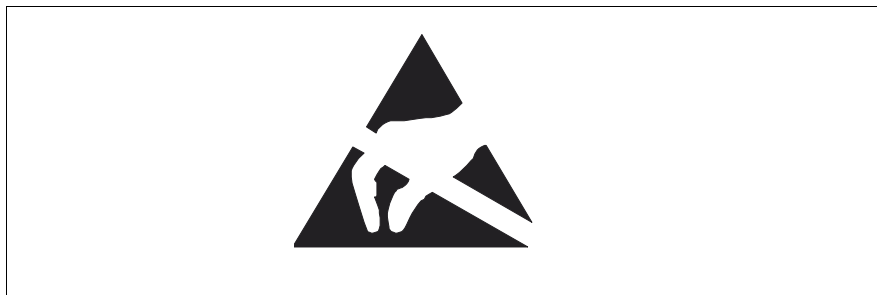


Figure 1: ESD label

When you handle components fitted with ESDs, you must observe the following points under all circumstances:

- Remove the power plug from the power socket before inserting or removing components containing ESDs.
- You must always discharge yourself of static charges (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Only touch the components at the positions highlighted in green (touch points).
- Do not touch any exposed pins or conductors on a component.
- Use a grounding cable designed for this purpose to connect yourself to the system unit as you install components.

Safety notes

- Place all components on a static-safe base.



You will find a detailed description for handling ESD components in the relevant European or international standards (DIN EN 61340-5-1, ANSI/ESD S20.20).

4 Preparation



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

4.1 Opening the server

- ▶ Terminate all applications and shut down the server correctly.
- ▶ If your operating system has not switched off the server, press the on/off button.
- ▶ Pull all power connectors out of the power outlets.
- ▶ Disconnect all cables on the rear of the server.

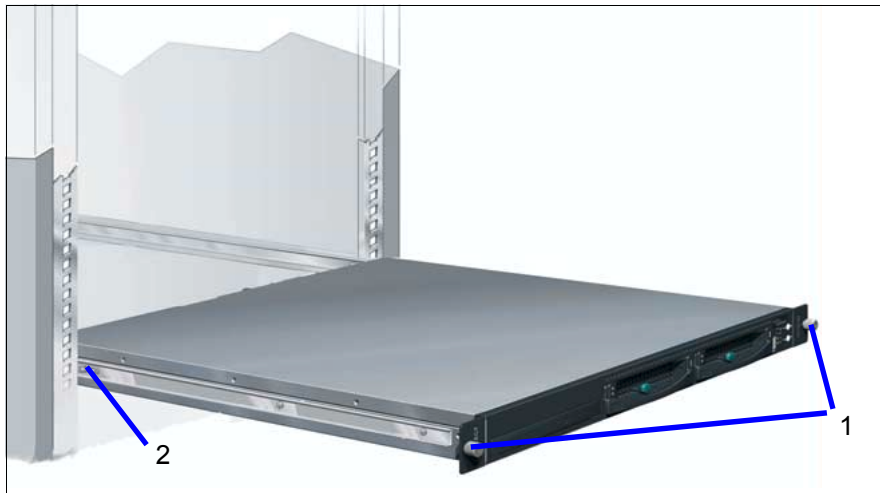


Figure 2: Pulling the server out of the rack

- ▶ Loosen the two knurled screws (1) and pull the server as far as possible out of the rack.
- ▶ Press the locking spring (1) on both sides and carefully pull the server outward.
- ▶ Pull the server out of the rails and place it on a table, for example.

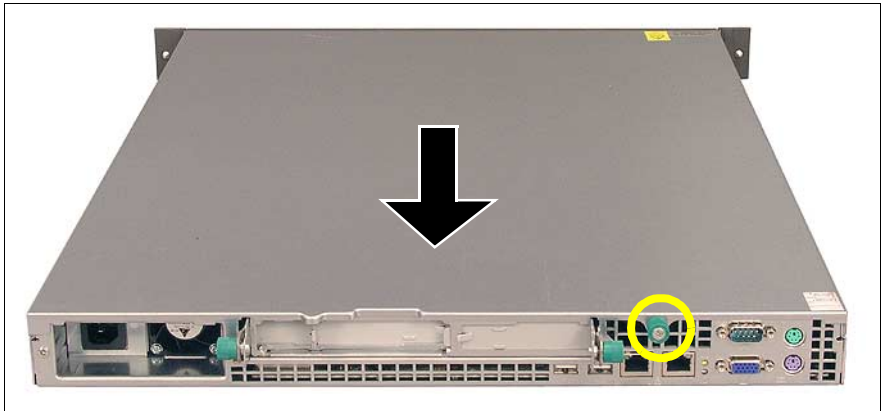


Figure 3: Loosening the screws

- ▶ Unlock the top cover by removing the knurled screw at the rear side.
- ▶ Push the top cover approximate 2 cm frontward.
- ▶ Remove the top cover.

5 Main memory



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

The system board supports up to 8 Gbytes of main memory. Four slots (2 slots form a memory bank) are provided for the main memory. Each memory bank can be equipped with 512 Mbyte, 1 Gbyte or 2 Gbyte unbuffered DDR II 533 (PC2-4200) SDRAM memory modules.

CPU Front Side Bus (FSB)	Memory frequency
533 MHz (Celeron)	533 MHz
800 MHz	533 MHz

5.1 Equipping rules

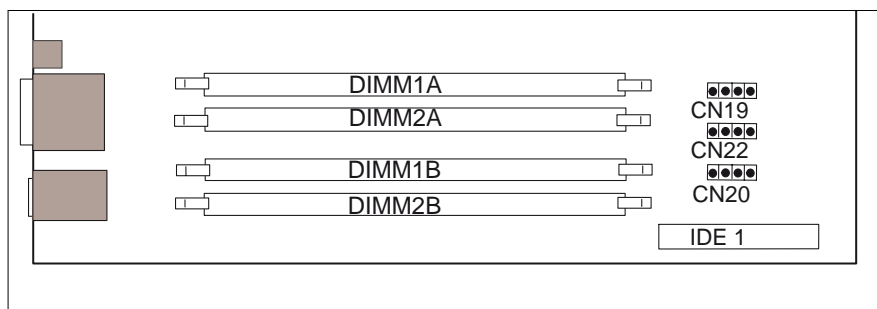


Figure 4: Structure of the main memory in memory banks and memory modules

- Mix of memory is permitted.
- For the dual-channel configuration: install identical memory modules in DIMM_1A and DIMM_1B and identical memory modules in DIMM_2A and DIMM_2B.

The table below shows the order in which the memory banks must be equipped:

Single-channel configuration

Basic configuration	DIMM_1A (black)	DIMM_2A (blue)	DIMM_1B (black)	DIMM_2B (blue)
Basic configuration with 1x memory module K987-Vxxx	X	-	-	-
Additional memory module F3000 -				
1x memory module: E513 E514 E515	Already populated by basic configuration	-	X	-
2x memory module: E513 E514 E515	Already populated by basic configuration	X	X	-
3x memory module: E513 E514 E515	Already populated by basic configuration	X	X	X

Dual-channel configuration

Basic configuration	DIMM_1A (black)	DIMM_2A (blue)	DIMM_1B (black)	DIMM_2B (blue)
Basic configuration with 1x memory module K987-Vxxx	X	-	-	-
Additional memory module F3000 -				
1x memory module: E513 E514 E515	Already populated by basic configuration	-	X	-
3x memory module: E513 E514 E515	Already populated by basic configuration	X	X	X

5.2 Extending/replacing the main memory

- Open the server as described in the [chapter “Preparation” on page 17](#) et seq. .

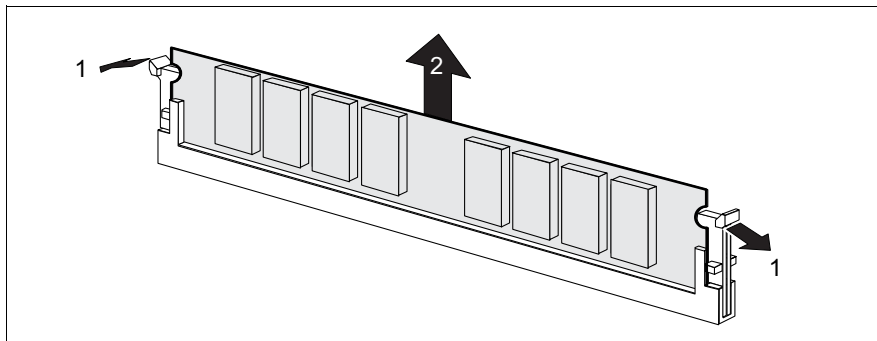


Figure 5: Removing a memory module

- Press the holders on either side of the mounting location concerned outward (1).
- If the mounting location was already equipped: pull the memory module out of the mounting location (2).

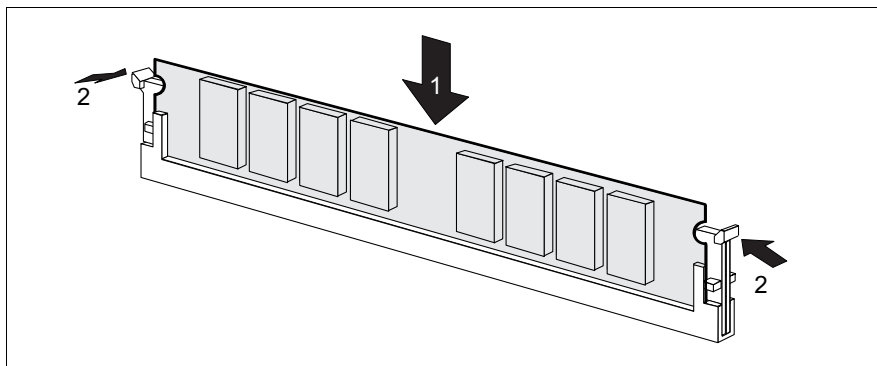


Figure 6: Inserting a memory module

- Press the holders on either side of the mounting location concerned outward.
- Insert the memory module in the mounting location (1) until the holders at the sides engage (2).

- Close the server, connect it to the power outlet, and switch it on as described in the [chapter “Completion” on page 37](#) et seq. .

6 Accessible drives



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

One 5.25-inch slimline bay is available for accessible drives.

6.1 Installing an accessible 5.25-inch slimline drive

The 5.25-inch slimline drives available are CD-ROM and CD-RW/DVD drives. These drives can be installed in the free 5.25-inch slimline bay.

- Open the server as described in the [chapter “Preparation” on page 17](#) et seq. .

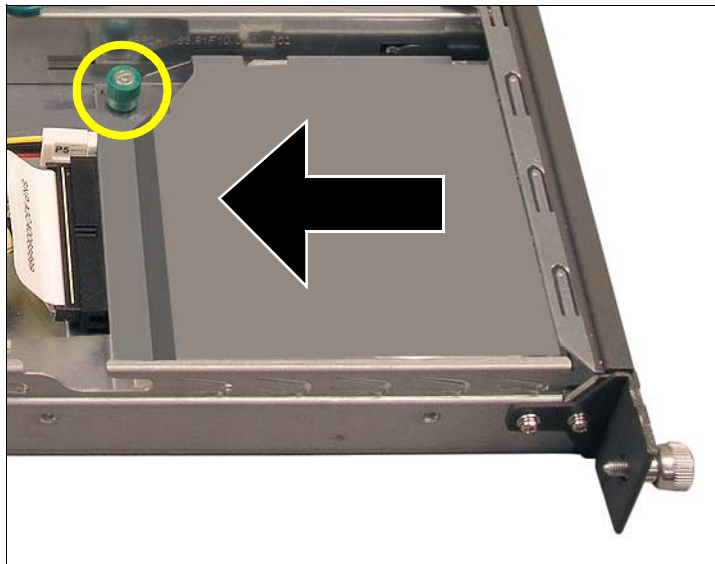


Figure 7: Removing the dummy cover

- Loosen the knurled screw (see circle).
- Push the dummy cover inward out of the bay.

**CAUTION!**

Keep the dummy cover for future use. If you remove the accessible drive again and do not replace it with a new one, the dummy cover must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

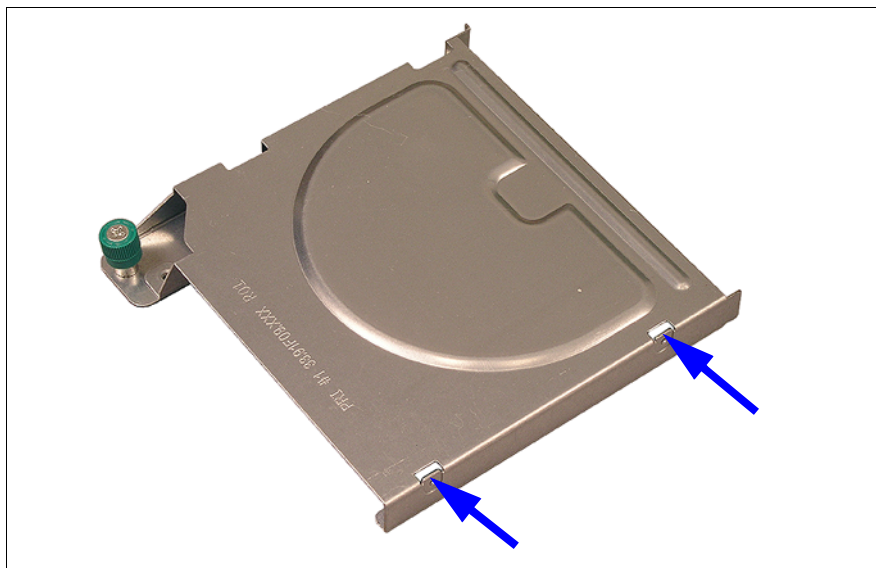


Figure 8: Mounting frame

- Push the 5.25-inch slimline drive in the mounting frame and fasten it with two screws on the left hand side (see arrows).

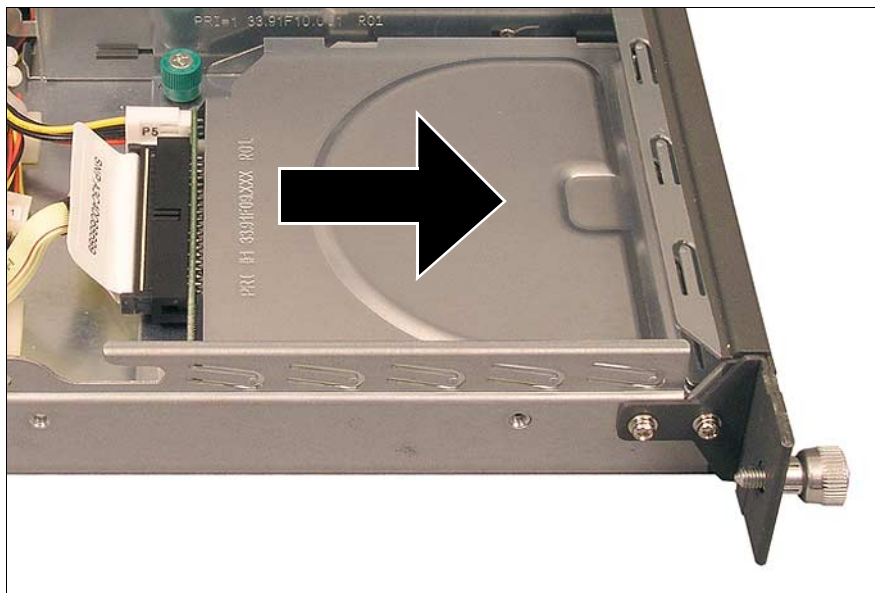


Figure 9: Connecting the cables

- ▶ Push the the mounting frame from the inside into the bay and fasten it with the knurled screw to the housing.
- ▶ Connect the data cable to the accessible drive (see the cabling plans in the Appendix).
- ▶ Connect the power cable connector P5 to the accessible drive (see the cabling plans in the Appendix).
- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter “Completion” on page 37](#) et seq. .

7 Non-hot-plug hard disks



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

7.1 Installing a second non-hot-plug SATA hard disk

- Open the server as described in the [chapter “Preparation” on page 17](#) et seq. .

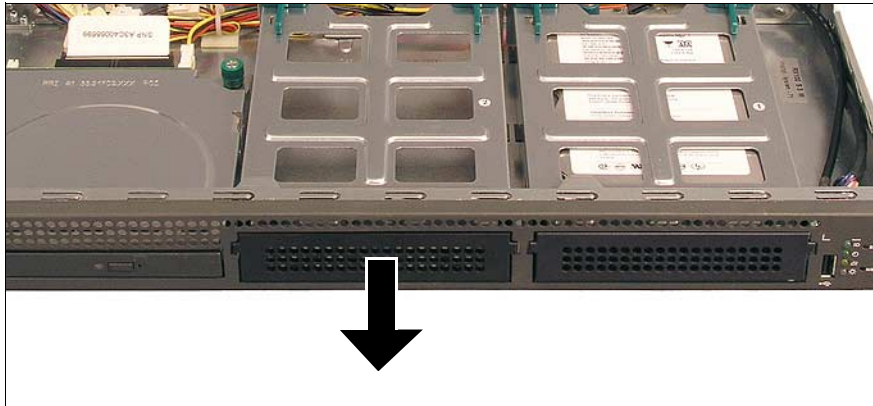


Figure 10: Removing the dummy cover

- Remove the dummy cover from the bay.



CAUTION!

Keep the dummy cover for future use. If you remove the accessible drive again and do not replace it with a new one, the dummy cover must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

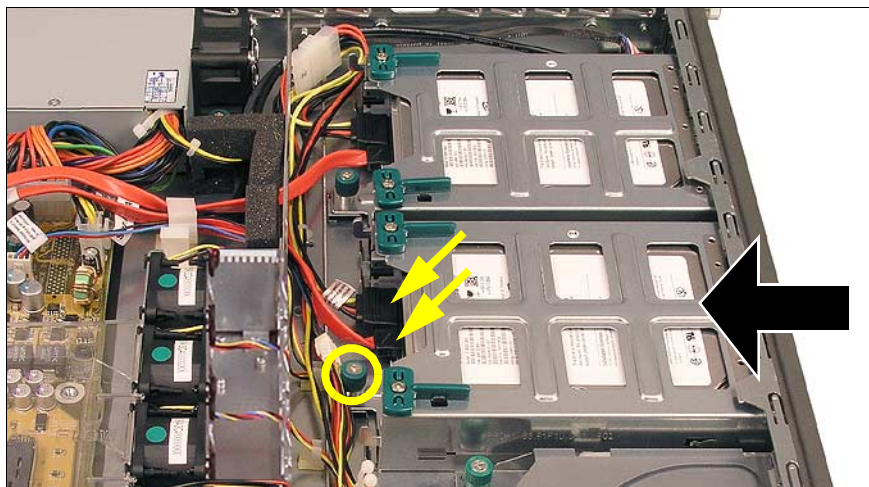


Figure 11: Inserting the new hard disk

- ▶ Push the mounting frame with the new hard disk into the bay and fasten the mounting frame with a knurled screw (see circle) to the housing.
- ▶ Connect the data cable to the hard disk (see the cabling plans in the Appendix).
- ▶ Connect the power cable to the hard disk (see the cabling plans in the Appendix).
- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter "Completion" on page 37](#) et seq. .

8 Controller in the PCI slots



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

The system board offers 2 x PCI-X (64 Bit / 133 MHz) or 1x PCI-Express x4 and 2 x PCI-X (64 Bit / 133 MHz) slots by a riser card.

8.1 Installing a controller

- Open the server as described in the [chapter “Preparation” on page 17](#) et seq. .

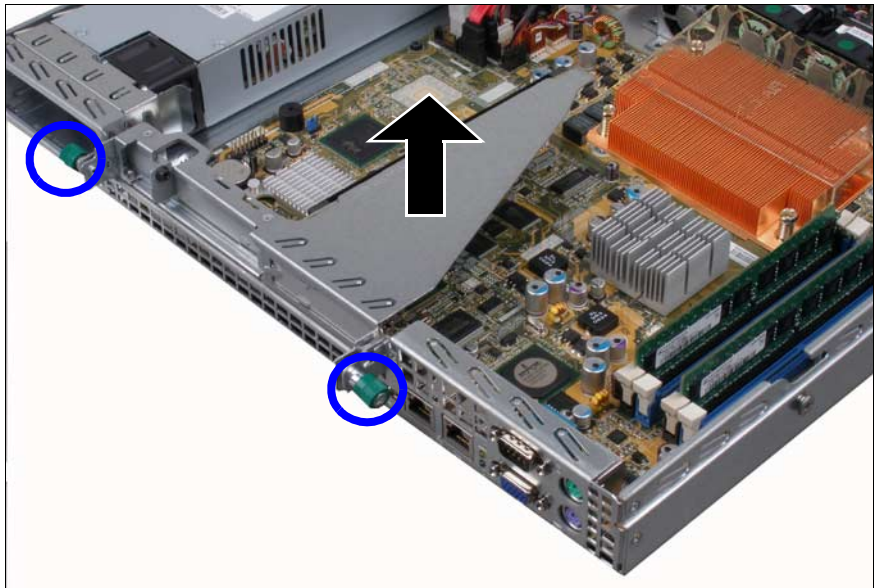


Figure 12: Removing the riser card holder

- Loosen the two knurled screws (see circles).
- Take the riser card holder upward out of the housing.
- Please read the documentation supplied with the controller.

- If necessary, connect cables onto the controller.

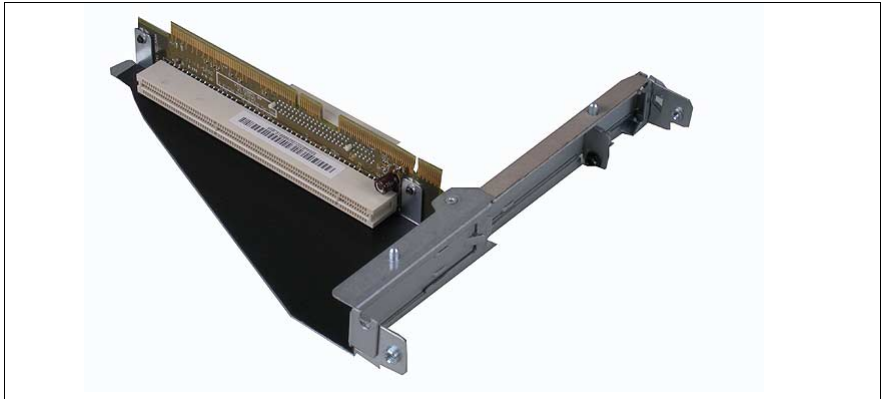


Figure 13: Riser card holder with riser card 1

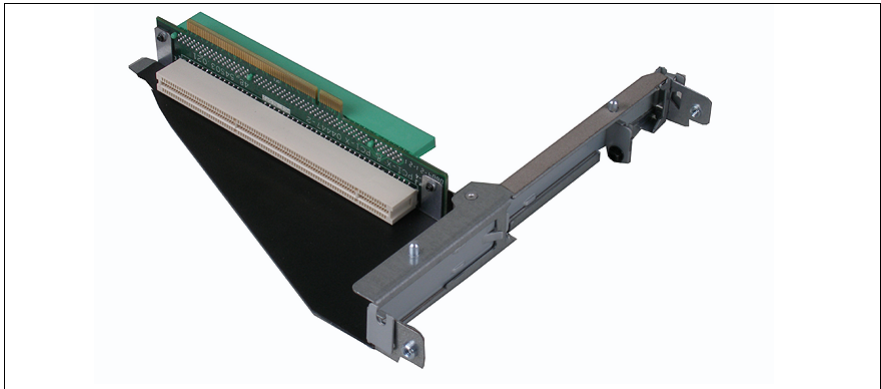


Figure 14: Riser card holder with riser card 2

- Remove the PCI slot's rear cover.



CAUTION!

Keep the rear cover of the PCI slot for future use. If you remove the controller again and do not replace it with a new one, the rear cover must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

- Install the controller in the PCI slot of the riser card. Make sure that the rear of the controller's slot cover is positioned in the intended recess.

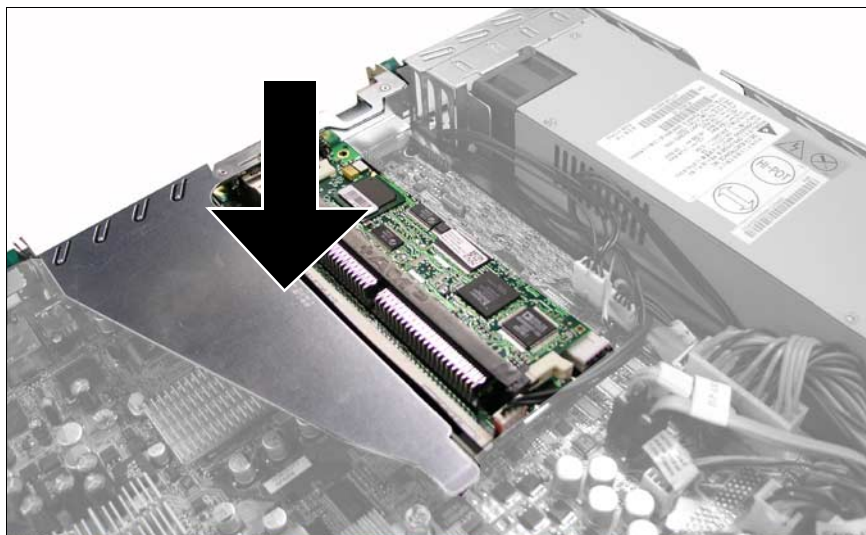


Figure 15: Installing the riser card holder

- ▶ Plug the riser card into the PCI slot of the system board.
- ▶ Fasten the riser card holder with two knurled screws to the housing's rear side.
- ▶ If required, connect the cables to the system board or other components.
- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter "Completion" on page 37](#) et seq. .

9 Upgrade kit hot-plug variant



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

9.1 Upgrading to hot-plug variant

- Open the server as described in the [chapter “Preparation” on page 17](#) et seq. .

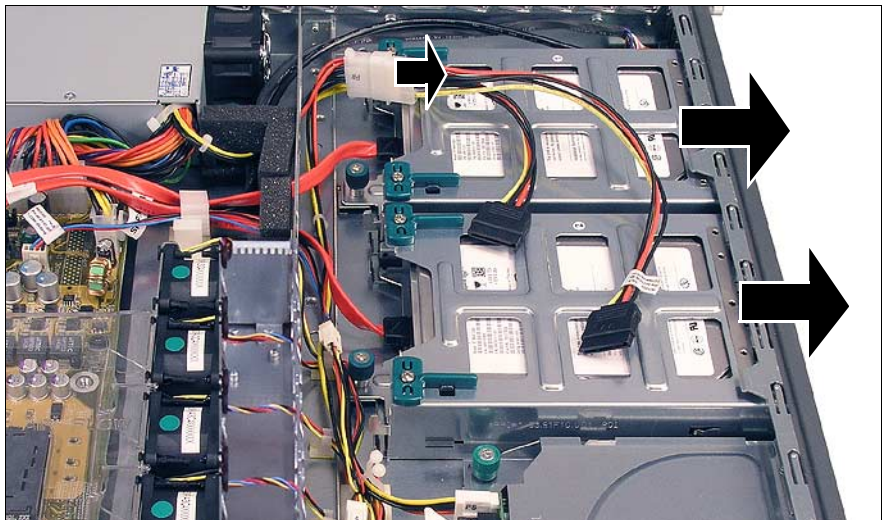


Figure 16: Removing the non-hot-plug hard disks

- Remove the power connectors from the non-hot-plug hard disks.
- Remove the Y-cable from the connector P4 of the power supply.
- Remove the data cables from the non-hot-plug hard disk.
- Loosen the knurled screws.
- Push the non-hot-plug hard disks out of the bays frontward.

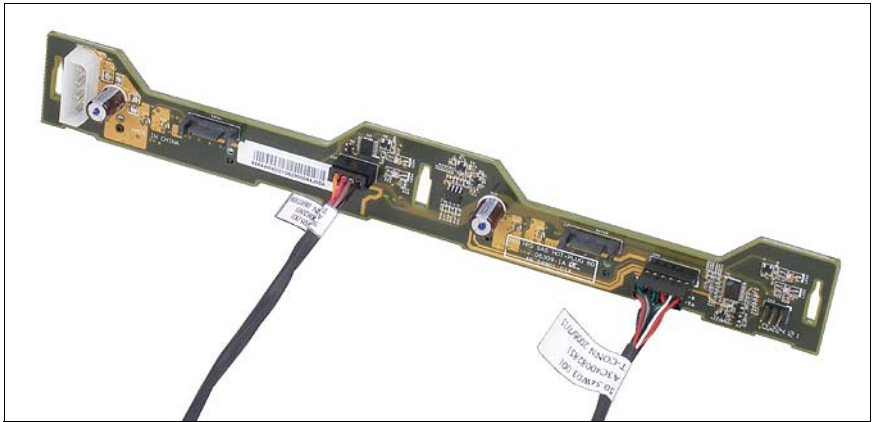


Figure 17: SAS/SATA backplane

The LED cable and the I²C cable are already connected to the SAS/SATA backplane.

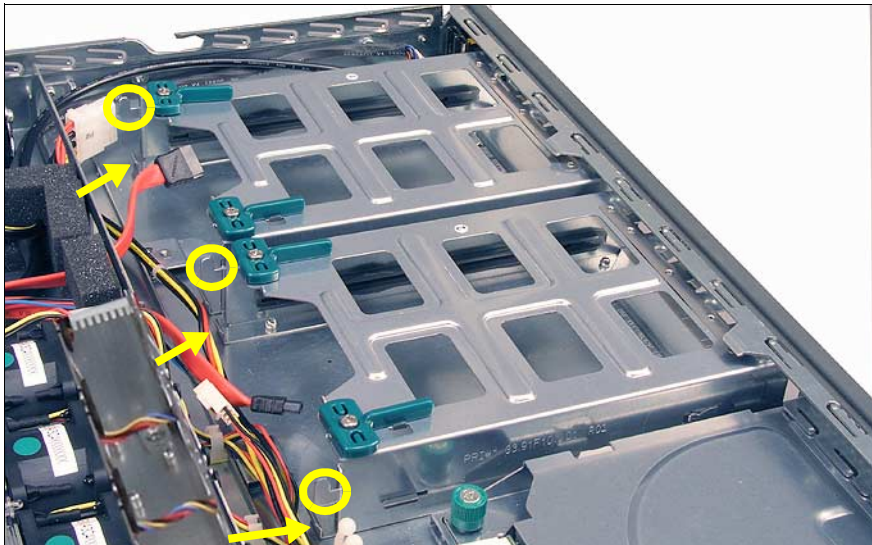


Figure 18: Installing the SAS/SATA backplane

- Position the SAS/SATA backplane on the hooks (see circles). Make sure that the SAS/SATA backplane fits in the guidances (see arrows).

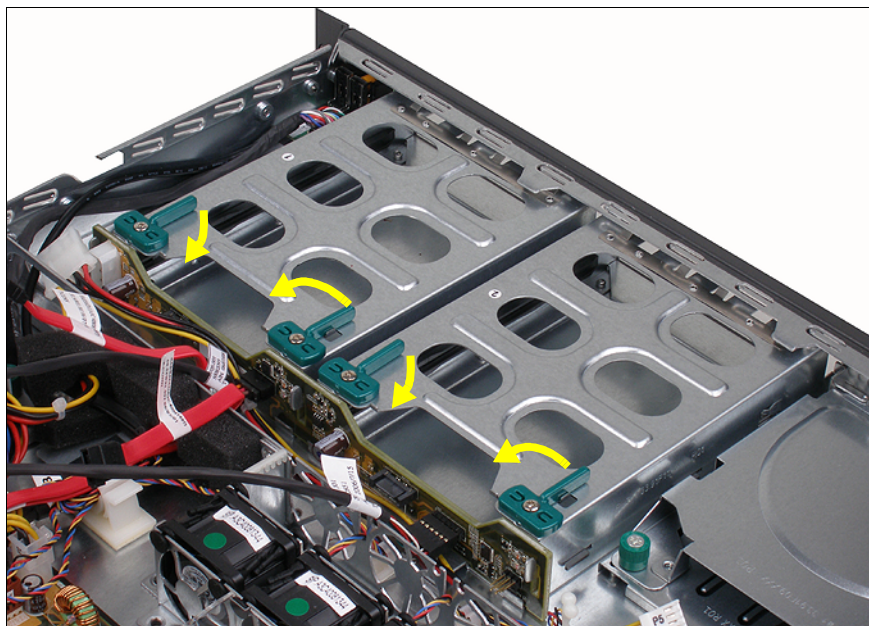


Figure 19: Fastening the SAS/SATA backplane

- Fasten the SAS/SATA backplane by pushing the green levels in direction of the arrows.

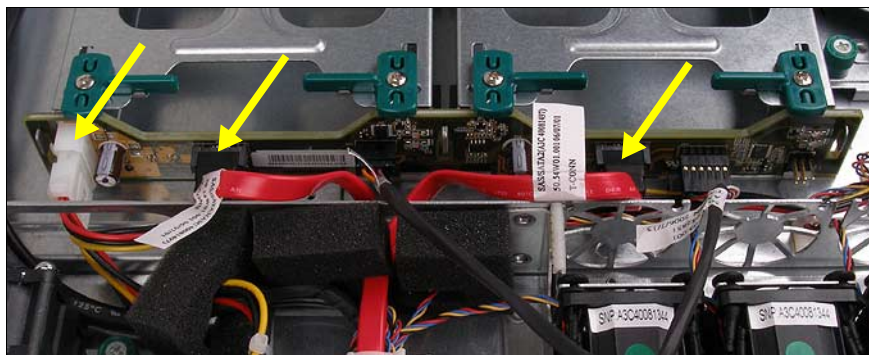


Figure 20: Connecting cables

- Connect the connector P4 of the power supply and the two SATA cables to the SAS/SATA backplane.

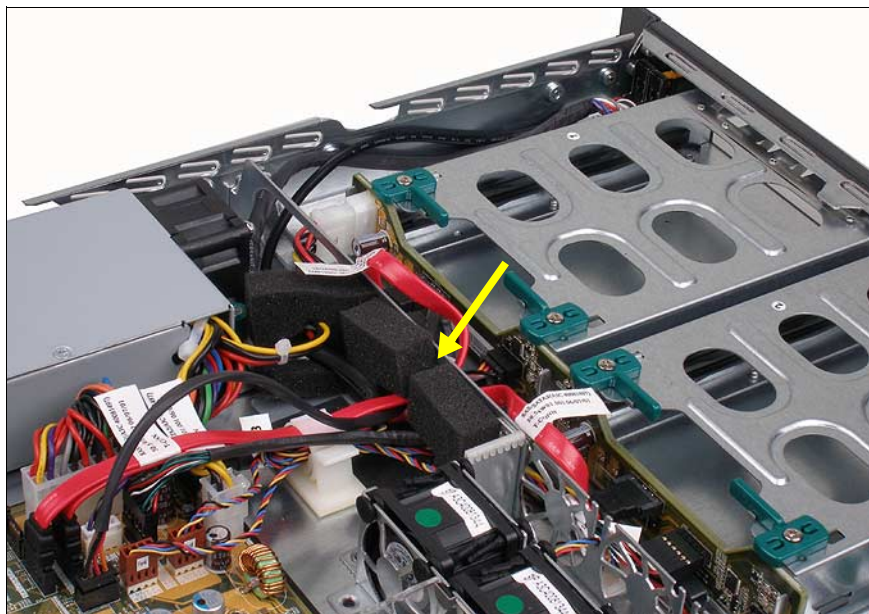


Figure 21: Leading the cables

- ▶ Thread the I²C cable and the LED cable through the separating plate (see arrow).
- ▶ Connect the I²C cable to the connector CN17 on the system board.
- ▶ Connect the LED cable to the connector CN11 on the system board.
- ▶ Install the new hot-plug hard disks as described in the Operating Manual RX100 S4.
- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter “Completion” on page 37](#) et seq. .

10 Completion



CAUTION!

Observe the safety instructions in the [chapter “Safety notes” on page 11](#) et seq. .

10.1 Closing the server

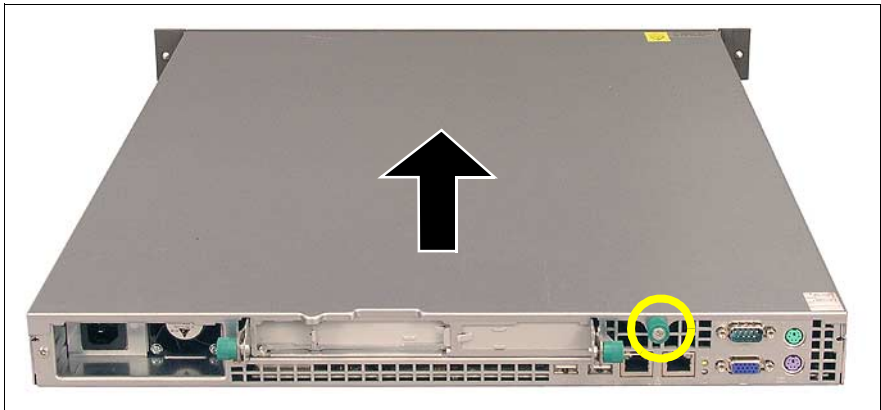


Figure 22: Attaching the top cover

- ▶ Position the top cover in such a way that it protrudes approximate 2 cm at the rear.
- ▶ Push the top cover all the way in direction to the front side.
- ▶ Fasten the top cover with the knurled screw.

If you have not removed the server from the rack cabinet, please skip this page.

- ▶ Push the server from the frontside in the extended telescopic rails.
- ▶ Reconnect all the cables you disconnected beforehand on the rear of the server.

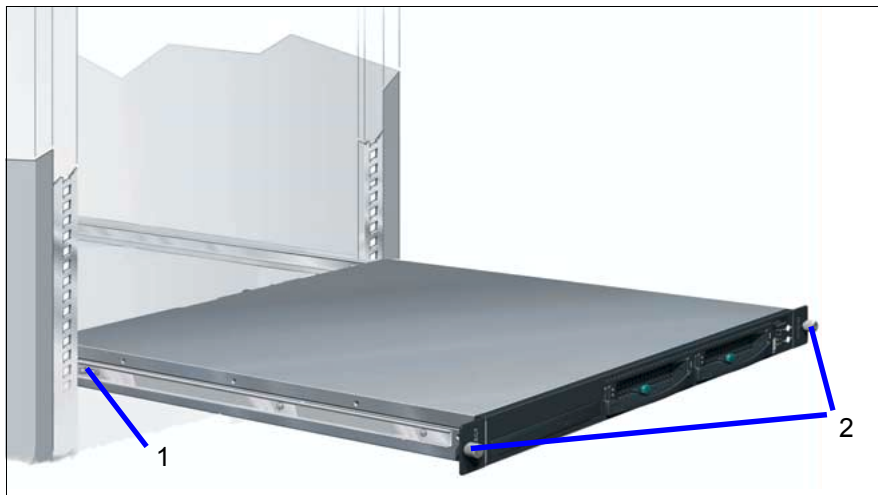


Figure 23: Installing the server in a rack cabinet

- ▶ Press in the locking spring (1) on both sides and push the server as far as it will go into the rack.
- ▶ Fasten the server in the rack using the two knurled screws (2).
- ▶ Connect all power plugs to the power outlets.
- ▶ Press the on/off key to start up the server.

11 Appendix

11.1 Cabling

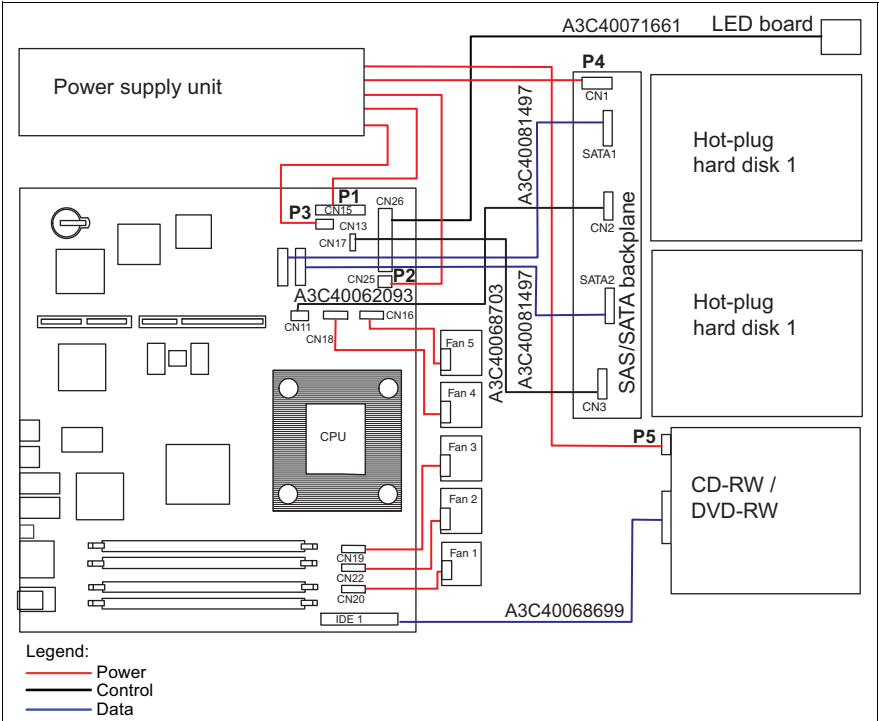


Figure 24: Cabling of the hot-plug variant

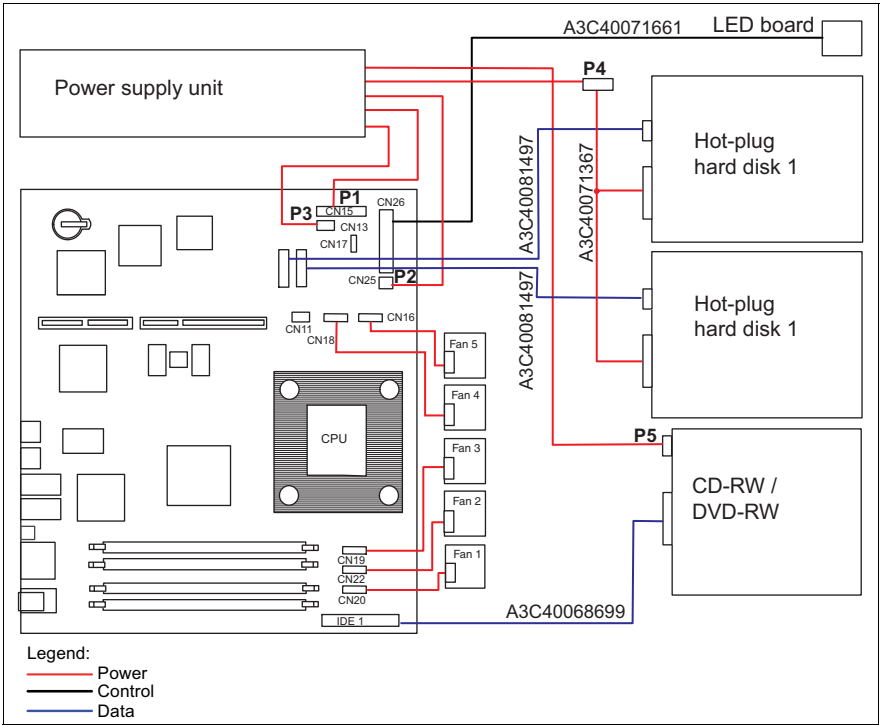


Figure 25: Cabling of the non-hot-plug variant

Abbreviations

AC

Alternating Current

ANSI

American National Standard Institut

ASR&R

Automatic Server Reconfiguration and Restart

BIOS

Basic Input-Output System

BMC

Baseboard Management Controller

CC

Cache Coherency

CD

Compact Disk

CD-ROM

Compact Disk-Read Only Memory

CHS

Cylinder Head Sector

CMOS

Complementary Metal Oxide Semiconductor

COM

Communication

CPU

Central Processing Unit

DC

Direct Current

Abbreviations

DIMM

Dual Inline Memory Module

DIP

Dual Inline Package

DMA

Direct Memory Access

DMI

Desktop Management Interface

ECC

Error Checking and Correcting

ECP

Extended Capabilities Port

EEPROM

Electrically Erasable Programmable Read-Only Memory

EMC

ElectroMagnetic Compatibility)

EMP

Emergency Management Port

EPP

Enhanced Parallel Port

ESD

ElectroStatic Discharge

FPC

Front Panel Controller

FRU

Field Replaceable Unit

FSB

Front Side Bus

GAM

Global Array Manager

GUI	Graphical User Interface
HDD	Hard Disk Drive
HSC	Hot-Swap Controller
I²C	Inter-Integrated Circuit
I/O	Input/Output
ICM	Intelligent Chassis Management
ID	Identification
IDE	Intergrated Drive Electronics
IOOP	Intetelligent Organization of PCI
iRMC	integrated Remote Management Controller
IRQ	Interrupt Request Line
LAN	Local Area Network
LBA	Logical Block Address
LCD	Liquid Crystal Display
LUN	Logical Unit Number

Abbreviations

LVD	Low-Voltage Differential SCSI
MMF	Multi Mode Faser
MRL	Manually Retention Latch
NMI	Non Maskable Interrupt
NVRAM	Non Volatile Random Access Memory
OS	Operating System
PCI	Peripheral Component Interconnect
PDA	Prefailure Detection and Analysing
POST	Power ON Self Test
RAID	Redundant Arrays of Independent Disks
RAM	Random Access Memory
ROM	Read-Only Memory
RSB	Remote Service Board
RTC	Real Time Clock
RTDS	Remote Test- und Diagnose-System

SAF-TE

SCSI Accessed Fault-Tolerance Enclosures

SAS

Serial Attached SCSI

SATA

Serial ATA

SBE

Single Bit Error

SCA

Single Connector Attachment

SCSI

Small Computer System Interface

SDDC

Single Device Data Correction

SDR

Sensor Data Record

SDRAM

Synchronous Dynamic Random Access Memory

SEL

System Event Log

SMI

System Management Interrupt

SSU

System Setup Utility

SVGA

Super Video Graphics Adapter

USB

Universal Serial Bus

VGA

Video Graphics Adapter

Related publications

Manuals for PRIMERGY server systems are available as PDF files on the *ServerBooks* CD. The *ServerBooks* CD is part of the *PRIMERGY ServerView Suite* delivered with each server system.

The current versions of the required manuals can be downloaded free of charge as PDF files from the Internet. The overview page showing the online documentation available on the Internet can be found via the URL:

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